THE ARCHES

"The Arches" in Letchworth shows a refreshing approach by architects, Michael williams & Associates, to the design of small business and industrial units.

A sense of unity has been achieved by arranging the units around a courtyard with access via an impressive archway which links the two roadside buildings into one dramatic elevation.

In producing this arch entrance, the following factors were of particular concern to the Consulting Engineers, Pearson Ellis Partnership:

1) Ease of construction/installation.
2) Preserving the width of access between the buildings to the greatest possible degree.
3) Structural stability against substantial wind forces acting on all sides of the exposed supporting arch lintel.

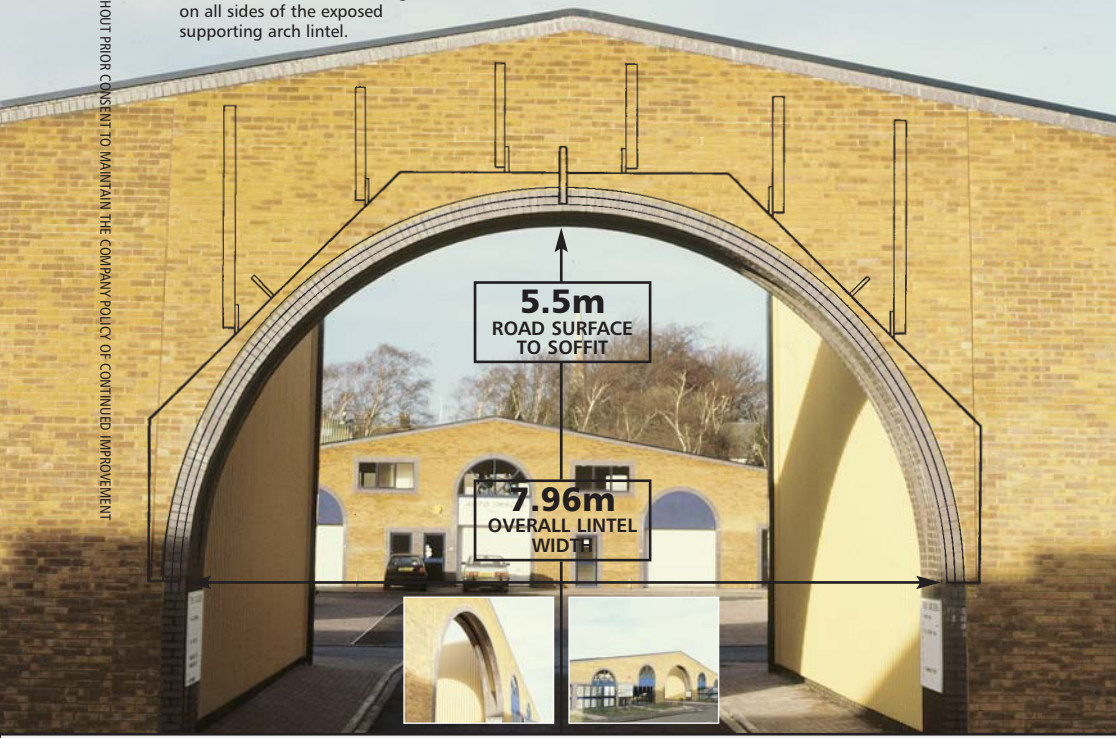
While being very heavy and difficult to install, a traditional concrete frame would have needed relatively large buttress support. In comparison, our "Superlintel" technology permitted a more space-saving solution through the special engineering of connections and bearings which impede less on the entrance width.

Supporting a 1m wide arch comprised of four brick reveal, the lintel assembly is made up of four sections for ease of installation.

The lintel bearing was designed to anchor to the thinnest possible plinth construction. Structural stability is engineered vertically into a very deep endplate which saves further space by connecting to the ring beam 1.2 metres above the bearing levels for lateral restraint.

Our Technical Manager, comments: "The bearing design was also complicated by the curved fin plates which form an essential part of the cross-sectional lintel profile in providing invisible supports for the external bricks to the sides and soffit of the arch."

Designed for a wind speed factor of 39 m/sec, the full height of facing brick on either side is restrained by vertical steel angles in compliance with building requirements. This detail is shown in the drawing superimposed on our main photograph which is intended to give an impression of the positioning and size of the lintel.



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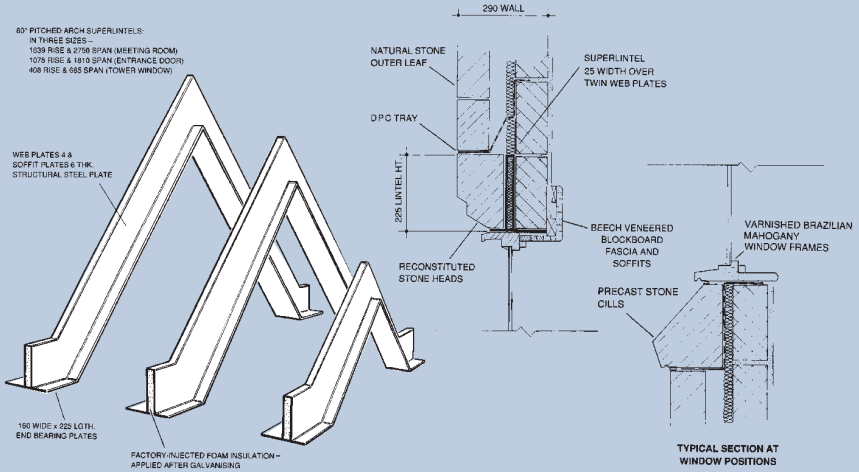
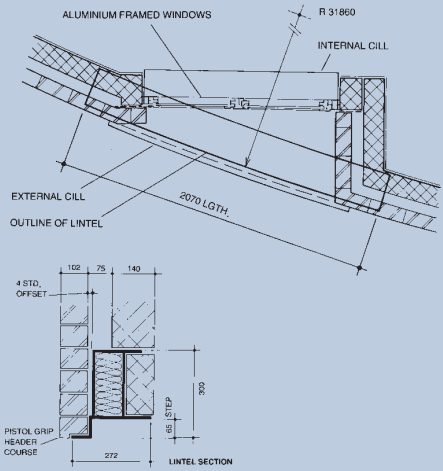
JONES OF OSWESTRY

80° pitched arch 'Superlintels' designed with fully insulated narrow top hat section, to be accommodated behind 150mm wide head and cill sections.



To link the different planes of the existing Duncan and Stenhouse buildings, curvedon-plan "Superlintels" were used. Where the brick piers were tied back to the structural column, or jambs were too close to give sufficient bearing, the lintels were notched to make the neccesary connection



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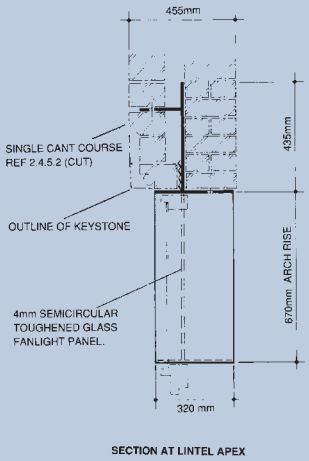
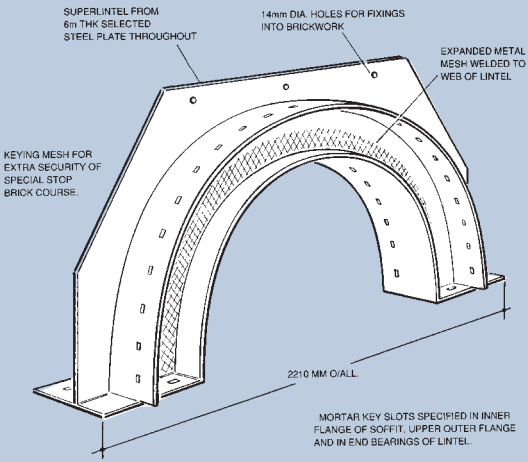
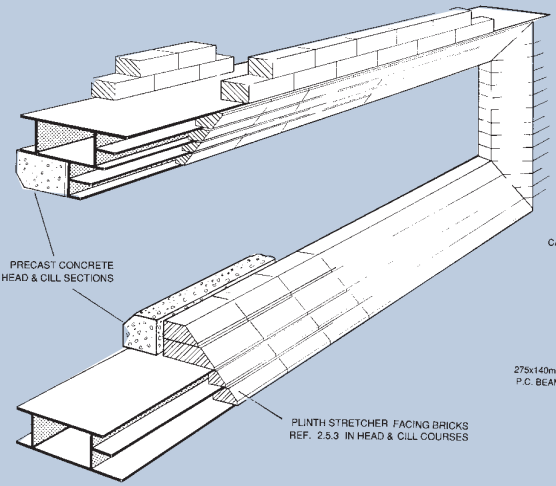
Semicircular arched soffit supporting corbelled feature brickwork over entrance doorway.



SECTION AT LINTEL APEX



Superlintel 'Sets' for the head and cill of deep-reveal feature windows, in 665mm diaphragm walling of new theatre.



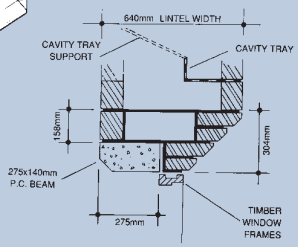
LINTEL DETAILS: HEAD & CILL

LENGTH 1700 mm O/ALL

CLEAR SPAN 1250mm

MATERIAL 4mm THK.

STRUCTURAL STEEL PLATE, 275 N/mm² MIN YIELD STRESS, TO BS 1449 PT 1 & TO BS 5977



SECTION AT WINDOW HEAD

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ANNABEL'S NIGHTCLUB

The reconstruction of old buildings often demands special structural solutions, particularly if the architect is seeking to reproduce the original form contemporary styling appropriate to the future use of the building.

For the support of unusual windows, engineers may find themselves tackling composite solutions combining steel beams and angles which we can refine into one intrinsic profile using our CAD based technology.

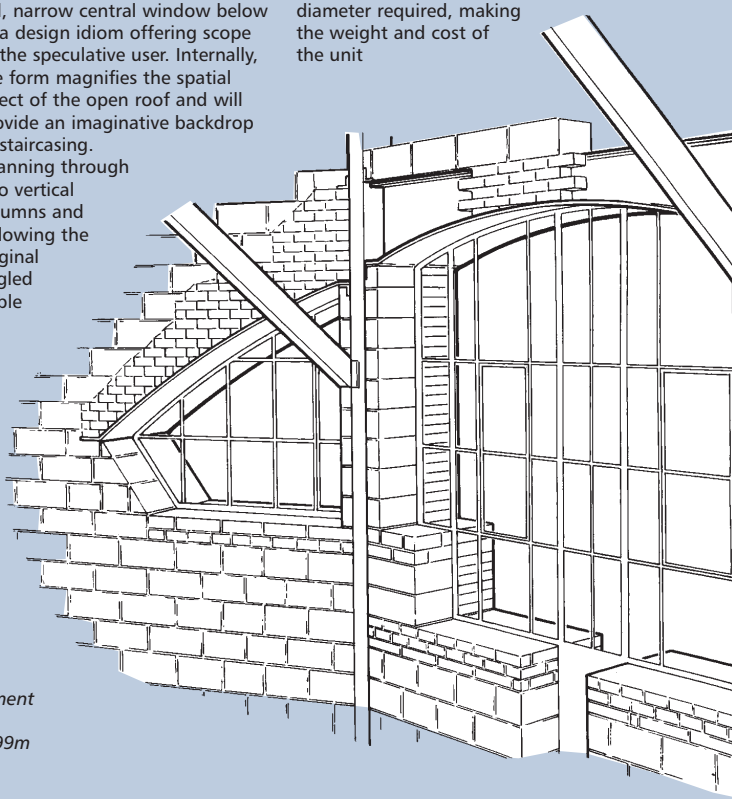
Such was our involvement in the speculative refurbishment of this Victorian warehouse in Bristol, by architects, Roger Wilson & Company.

The rear elevation had deteriorated into a patchwork of crumbling openings, exposed steelwork and brickwork repairs, with serious wall bulging in places, and needed completely rebuilding.

A ground beam was cast just below ground level where the foundations were of unknown quality. Construction to first floor level is traditional 100/100/225 cavity wall. To allow for the possible introduction of a staircase between the 2nd and 3rd floors, the wall was stabilised against windloads with two 200 x 200 x 6.3 RHS column splitters hooked up to a existing timber roof struts and purlins, and a 150 x 100 x 5 RHS hooked into by the third floor arch lintels.

The idea for the large arch window head sprang out literally from the tall, narrow central window below as a design idiom offering scope to the speculative user. Internally, the form magnifies the spatial effect of the open roof and will provide an imaginative backdrop to staircasing.

Spanning through two vertical columns and following the original angled gable on plan, this 10m glazed span presented a complex equation of loading, span and profile shape. Mr. David Glastonbury from Consulting Engineers, Jenkins & Potter, commented: "In the very initial stages of planning, we looked at the feasibility of using a steel beam with circular steelwork. A very thick column section would have been necessary to form the diameter required, making the weight and cost of the unit



Cut-away showing 'Superlintel' arrangement within wall construction.
Overall length of lintel assembly = 10.299m
Overall height of lintel = 1.997m
Arch soffit radius achieved = 8.034m
Clear span of centre section = 4.350m
Clear span of each end section = 2.300m

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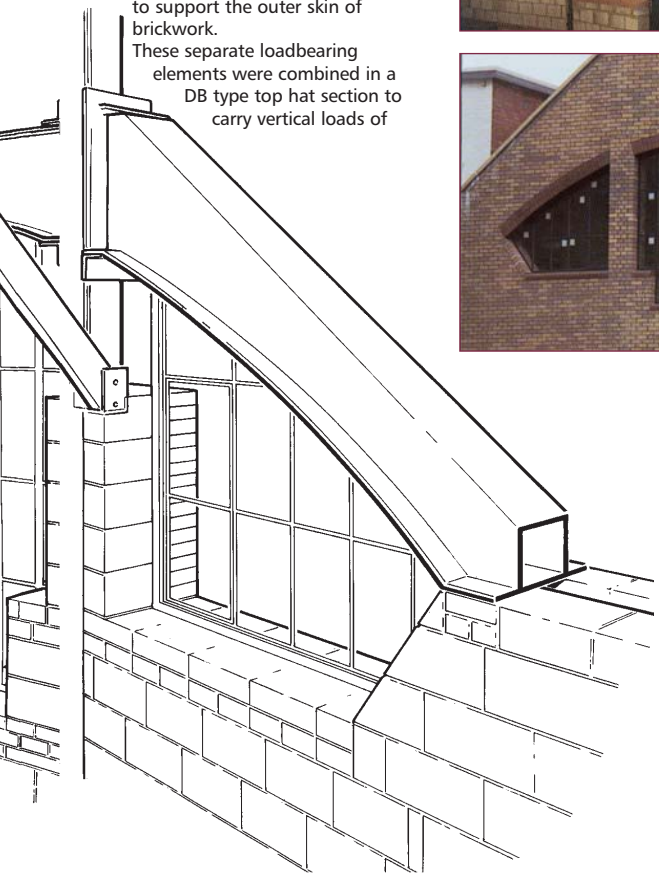
excessive. We found, however, that the required performance could be engineered into the much lighter and finer steel plate profiling of a Superlintel."
The composite steelwork solution submitted to our designers for assessment incorporated a 203 x 203 curved UC section acting as a beam with bolted brackets picking up a separate 150 x 90 curved RSA to support the outer skin of brickwork.
These separate loadbearing elements were combined in a DB type top hat section to carry vertical loads of



4.2 KN/m on the outer leaf and 14.5 KN/m on the inner leaf.
The 3-part 'Superlintel' comprises a 4580 mm long central section with a 300mm arch rise, and two 2639.5mm sloping end sections with a 107mm rise and splayed endplates to effect a 10° angle on plan.
To allow connection to the vertical steel columns with angled cleats and seating brackets, the lower lintel flange resumes a horizontal profile thereby disrupting the line of the arch. With the benefit of DAXCAD, we compensated for this by extending the endplates and reducing the rise of the two end lintels to restore the line of the central arch.
We supplied a further 9 special arch 'Superlintels' for the first and second floor windows, incorporating web stiffeners to resist the highly loaded piers.

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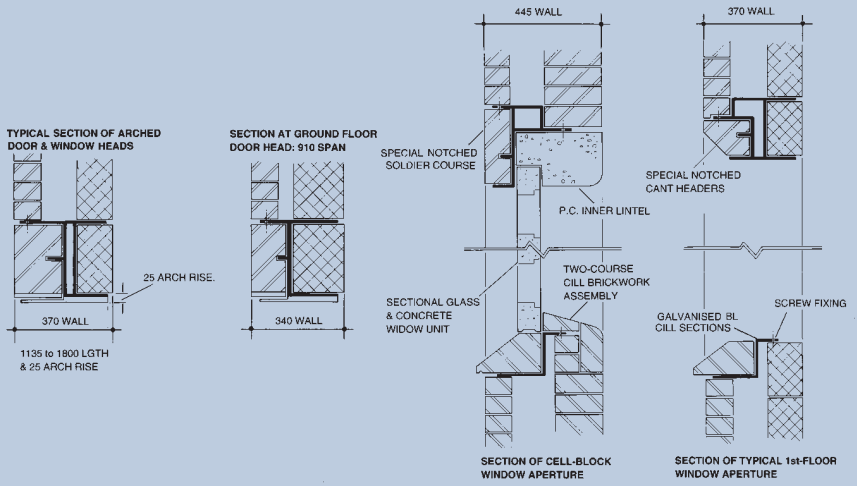
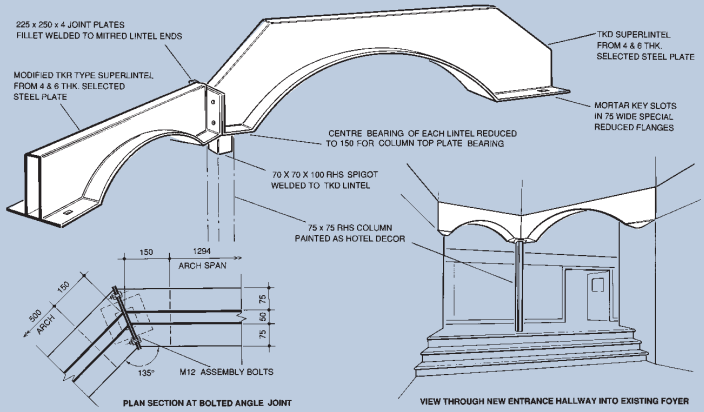
A selection from the many specially designed arched and straight and cill sections specified for a police H.Q. to exacting requirements, including those for hich security sections of the building.



Arched Superlintel assemblyf at 135° angle on plan and spanning 750 and 1700mm on either side of support column, with fair faced brickwork on both sides of archway.



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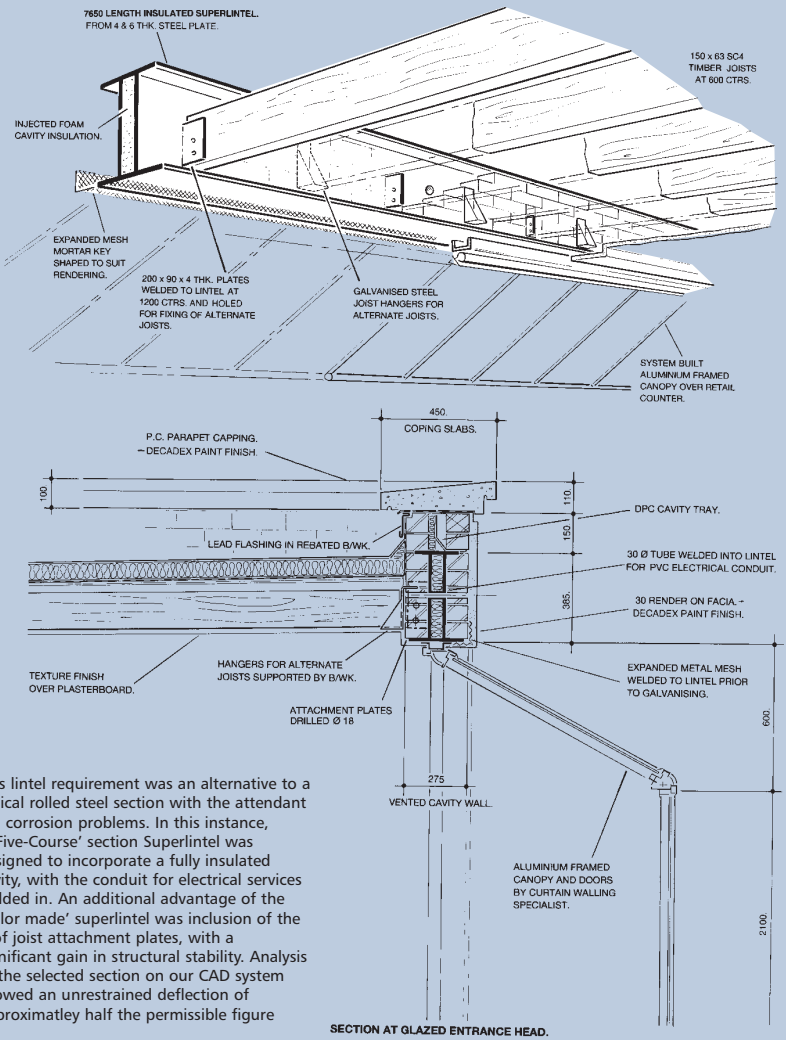
'Superlintel' supporting brick parapet wall, and carrying roof load over 7.2 metre span, with integral attachment plates for timber roof joists.



SECTION AT GLAZED ENTRANCE HEAD.

This lintel requirement was an alternative to a typical rolled steel section with the attendant RSJ corrosion problems. In this instance, a 'Five-Course' section Superlintel was designed to incorporate a fully insulated cavity, with the conduit for electrical services welded in. An additional advantage of the 'Tailor made' superlintel was inclusion of the roof joist attachment plates, with a significant gain in structural stability. Analysis of the selected section on our CAD system showed an unrestrained deflection of approximatley half the permissible figure

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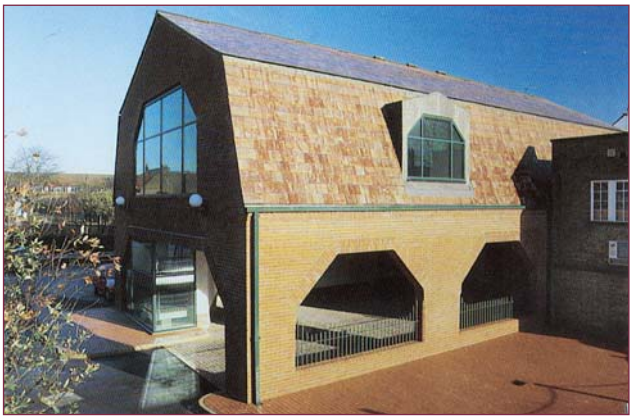


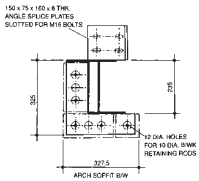


Fig. 1 Section at joint of lintel sections

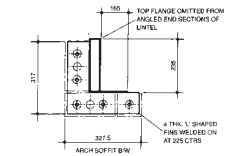
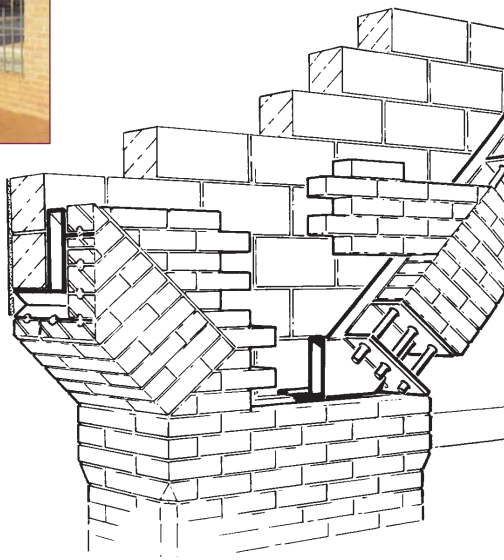


Fig. 2 Section of angled end sections



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BURKES PARADE OFFICES

Burkes Parade, Beaconsfield, presented a 'big lintel' challenge similar to Annabel's Nightclub with the Architect seeking design innovation while accommodating the very mixed architectural mood of surrounding buildings.

Designed by Hasilwood Design and management Ltd., Burkes Parade provides 6000ft² of office space and integrated garaging in two separate blocks. The scheme occupies a limited and irregular shaped plot of land dictated by planning restrictions relating to the site's historical use as a fire station which operated horsedown tenders.

Very distinctive to the design is the truncated pitched arch profile used for a variety of structural openings ranging from 3948mm to 9390mm. the 45° cranked ends make reference in-particular to semicircular and sloped windows in adjacent buildings. On the ground floor this unusual profile dominates over very ling spans, creating a feeling of space and allowing an unexpected plane of vision through to the nearby railway.

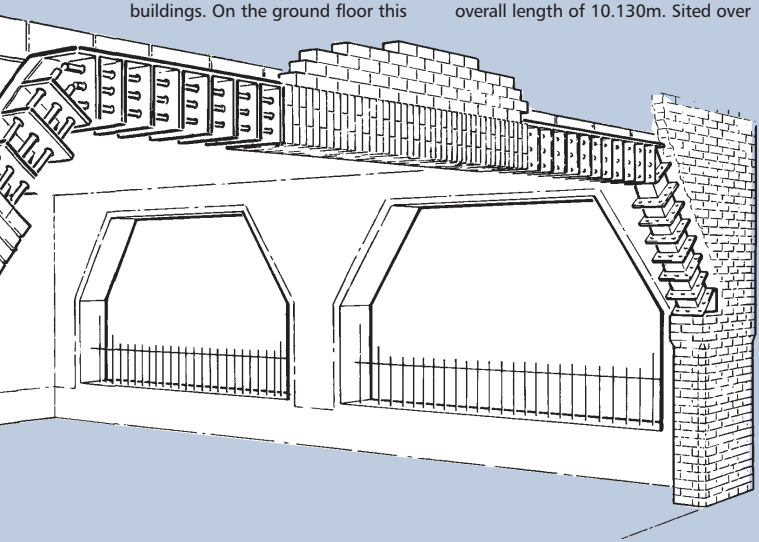
To accentuate these impressive spans the Architect wished to incorporate a brick layer, and approached the Structural Engineers for a solution. Structural Engineer, Chris Boydell, of Alan Conisbee & Associates, commented: "We looked at all sorts of clips and brackets, but there was no proprietary product that could be readily adapted to meet this brick fixing detail in manner required by the Architect. For the geometry requested, the only way forward was a special lintel design from Jones of Oswestry who we knew had the necessary design expertise and manufacturing capability."

The largest 'Superlintel' required was manufactured in two halves to an overall length of 10.130m. Sited over a garage opening, it is featured in our main illustration and in the three colour photographs featured opposite.

For the horizontal centre section of the lintel, a profile that suited the wall construction and loading was used, and provided two inner flanges for the seating of 7 cantilever brackets at 1.1m intervals for connection to the adjacent steel beam. Angle brackets and T-pieces for connecting the two lintel halves could be similarly accommodated on the two flanges.

It was necessary, however, to eliminate the external bottom flange and introduce an invisible means of brick fixing. By reversing the section on the x-axis, the external bottom flange assumed the external upper for the positioning of L-shaped vertical fin plates for brick fixing (see Fig. 1). This facility is maintained in the cranked ends where the section reduces to a top hat profile stiffened by a channel closure (see Fig. 2).

We simulated the dimensional composition of the brickwork on DAX-CAD to calculate the exact positioning and drilling of support plates. A total of 50 fins were provided at every third perpendicular point to suit varied SOPS, and were drilled in three places for the insertion of support bars on site through the brick vent holes.



Post Galvanising of the 'Superlintel' by the 'DURAGALV' process, the alternative to Stainless Steel, provides uniform, heavier duty protection to every surface.

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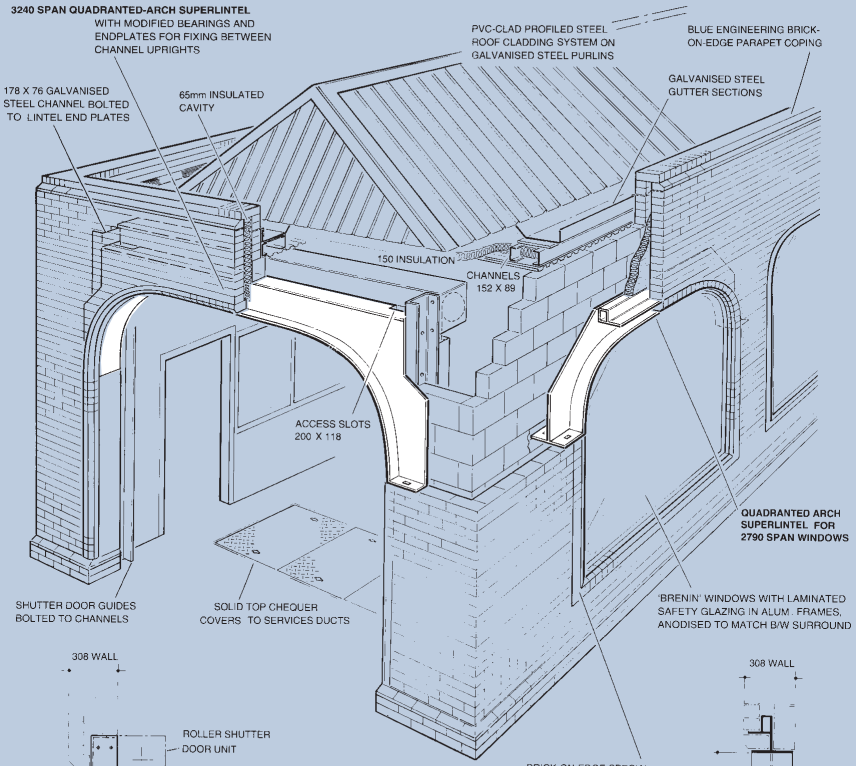
Quadranted arch Superlintels of 3.2m and 2.8m span, with specifiers' modifications, for end doorways and side windows respectively of purpose- built car wash wash hall.



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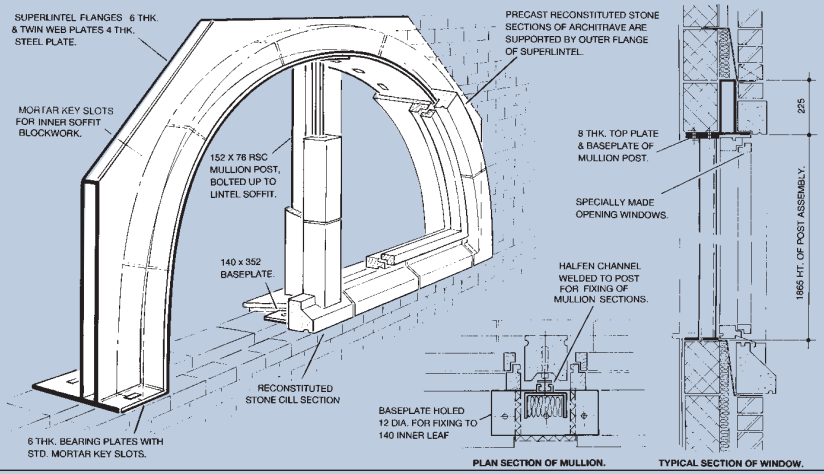
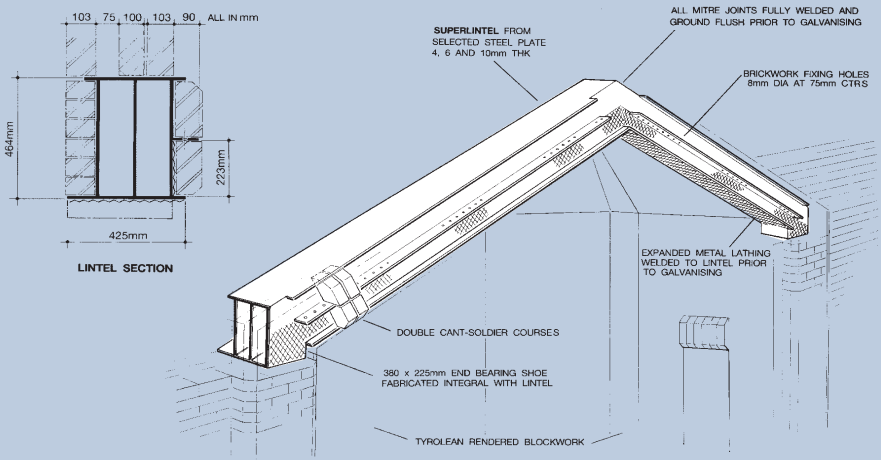
Semicircular arch 'Superlintel' of 3300m span, for 310mm cavity wall. Bolted-in channel section dividing post supports stone mullion of feature window.



Specially designed pitched arch Superlintel spanning 5639mm; and flanged to carry double soldier course with feature arch and key stones.



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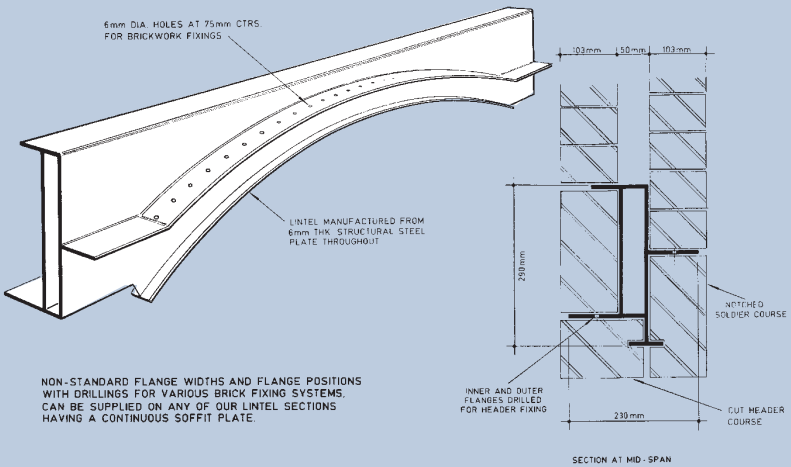
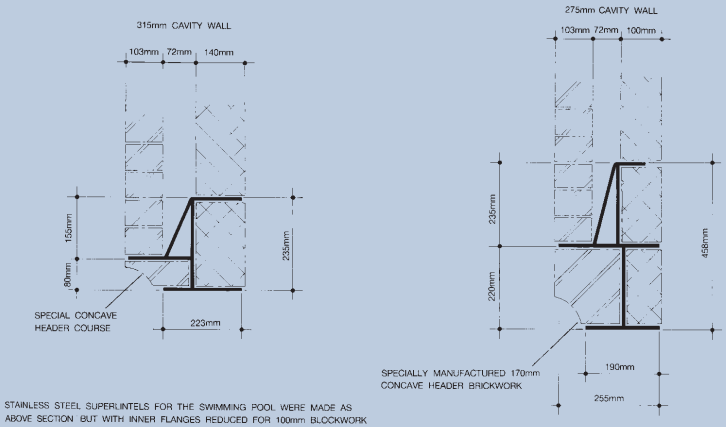
80° pitched arch 'Superlintels' specially designed with fully insulated narrow top hat section, to be accommodated behind 150mm wide head and cill sections.



NON-STANDARD FLANGE WIDTHS AND FLANGE POSITIONS WITH DRILLINGS FOR VARIOUS BRICK FIXING SYSTEMS, CAN BE SUPPLIED ON ANY OF OUR LINTEL SECTIONS HAVING A CONTINUOUS SOFFIT PLATE.

Special Designed Superlintels, based on CW range, to support feature concave header courses in 275 and 315mm cavity walls.



STAINLESS STEEL SUPERLINTELS FOR THE SWIMMING POOL WERE MADE AS ABOVE SECTION BUT WITH INNER FLANGES REDUCED FOR 100mm BLOCKWORK

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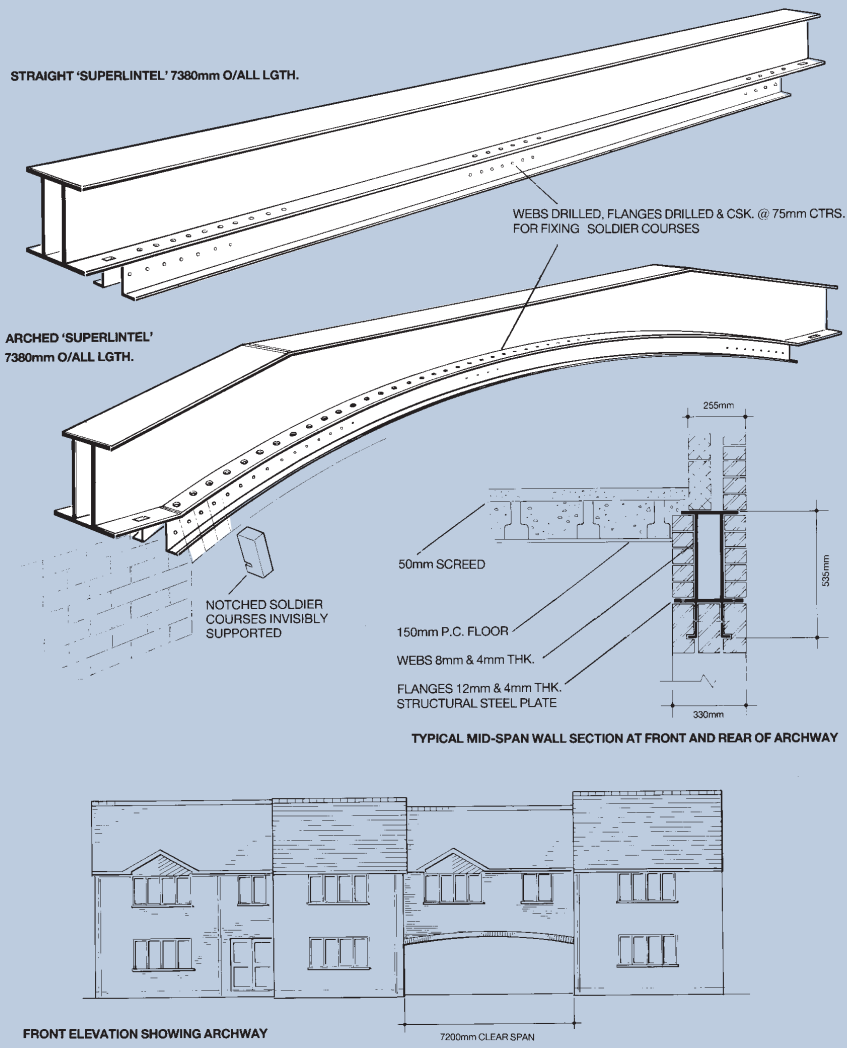
Straight and segmental arch concealed soffit 'Superlintels' for 7200mm clear span, drilled for fixing soldier courses on either side of suppoted walls.



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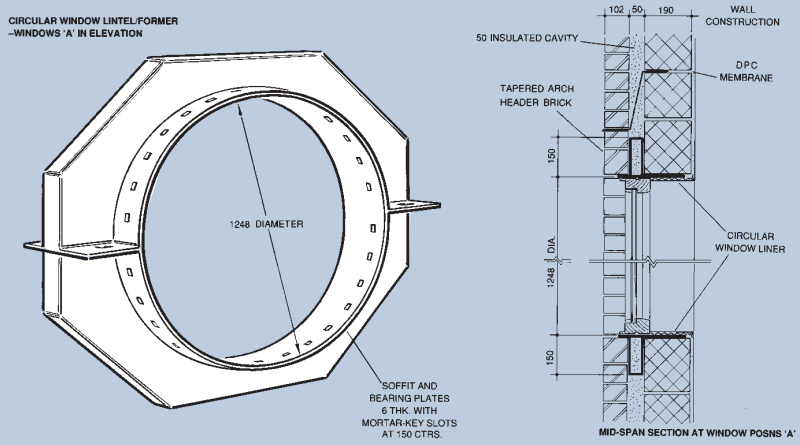
Insulated top hat section 'Superlintels for circular and semicircular window positions in new single storey school building.



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Technical FOCUS

OBLC ACCESSORY - OUT OF BALANCE LOADING CONDITIONS

We are constantly being asked by architects and engineers throughout the U.K. to evaluate **OUT OF BALANCE** loading conditions where, for example, a combination of roof loading, inner blockwork and floor loading can greatly exceed the permitted ratios of 3:1 and 5:1 for standard lintel profiles in our CW ranges as stipulated in

BS EN 845-2:2003.

Extreme cases can involve 90% of the total load to be carried passing down either the inner leaf or the outer skin of brickwork and, in the majority of cases it is simply a question of designing the particular leaf with sufficient strength to resist the bending moment introduced.

When this occurs on the inner leaf flange a lot will depend on the width of the internal blockwork as a 200 block width offers more scope to introduce additional web plates inside the lintel cavity itself and thus create a UB type support under the inner skin, as demonstrated in Fig 1.

When, for example, a 100 wide inner blockwork is being used, the channel insert, normally in 4mm thick structural steel plate for standard lintels, can be increased to 6mm or 8mm thick to take the extra load, as in Fig 02.

When the majority of the loading occurs on the outer leaf of the single bottom flange and is found to exceed the permitted flange loading, then it is desireable to introduce a top flange plate to the outer leaf as in Fig 3 and reverse the profile, thereby placing the support metal where it is wanted under the load.

Some engineers will put forward either universal rolled beams or channel sections to carry the inner leaf and plate these if neccessary including the attatchment of angles to support the outer brick skin, without appreciating that we can manufacture special lintels which are tailor-made to suit a particular application and which may have certain advantages over a combination of concrete inner leaf lintels with seperate outer leaf support angles bolted thereto.

This type of composite design involves site drilling of the concrete work with all the associated problems of lining and levelling for accuracy during construction.

With our CAD design and engineering capability, we can assimilate any combination of loading parameters to produce the correct profile. 'Out of balance' applications can be solved with a single steel section, hot dip galvanised as a unit for consistent long life durability by the 'Dura-Galv™' process and allowing straightforward installation without further forming.

In many cases, a it simply involves a modification in flange width, cavity width, or web depth to one of our many standard lintel profiles, representing, in effect, an 'off-the-shelf' design.

Computer controlled facilities and a highly skilled workforce allow us to fine-tune production for the most diverse requirements so that 'Superlintels' can be rapidly and economically manufactured.

When compared with the option of a composite support built up or adapted on site, a 'Superlintel' designed for the purpose offers a technically proven section, quality contolled at all stages of manufacture.

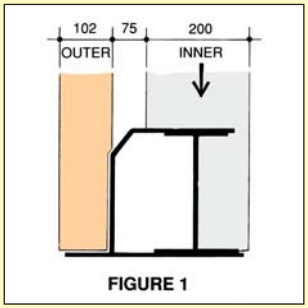

FIGURE 1

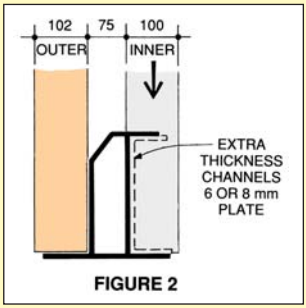

FIGURE 2

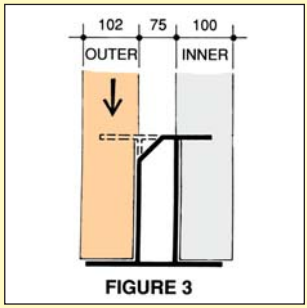

FIGURE 3

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Technical FOCUS

SFC ACCESSORY - STEEL FRAME CONNECTION

Where SUPERLINTELS have been specified for inclusion in steel framed buildings, the architect or engineer is sometimes faced with a situation where the end bearing is insufficient. For example, where the brickwork casing around a steel column is only half-a-brick wide, i.e. 102mm, this is not considered adequate by the professional team to support the lintel in a stable manner.

When this happens, the simplest and most practical solution is to continue the lintel through to the column and connect it using welded end plates or brackets, all of which can be incorporated in the lintel design and manufactured by our works during fabrication of the lintel.

Because SUPERLINTELS are manufactured mainly from 4mm, 6mm or 8mm thick plate there is always adequate web and flange material available for welded connections to be added. These can be designed in the manner of conventional structural steel work connections for bolting up on site.

Often the consulting engineers will make known their preferences for taking up the load either by dead bearing on brackets or bolts acting in shear.

Where appropriate, they will also specify moment connections to counteract torsional tendencies which may cause the lintel to rotate due to eccentric loading.

Connections for rolled steel sections have become well established over the years and most detailers of steel framed buildings follow predetermined and acceptable principles in deciding what type of end connection to adopt. This, of course, depends on the relationship of the beams and columns to be joined and the position of flanges to accept bolts, with consideration being given to adequate access for hand insertion and tightening to the critical torque settings after fitting.

Whereas beams and columns usually have enough room for sensible edge distances and bolt head centres, lintels, by virtue of their non-symmetrical shape, do not.

Furthermore, restrictions are also imposed on connections by outer facing brick priorities where bolt heads projecting into the outer skin are out of the question. In this instanve, we use the cavity width and inner flange space to advantage when arranging the position of the bolts.

Where seating brackets are unacceptable in order to maintain clear soffit lines for archtictural features such as arched curtain windows, the only alternative space left for bolted connections is the inner leaf space and cavity width, whether within the actual depth of the lintel itself or extended above it by means of hangers, for example.

Numerous examples of SFC accessory details are highlighted on the following 'Project Detail' pages.

For futher details contact:

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FIG. 1. SAXON GATE, SOUTHAMPTON

MITRED END LINTELS. WITH HANGERS, CONNECTED TO RHS CORNER COLUMN WITHIN CAVITY WIDTH.

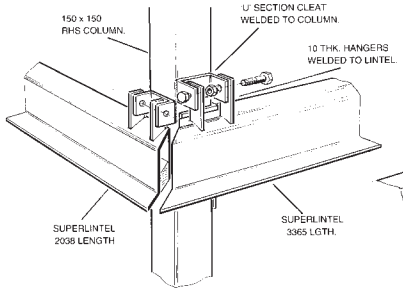
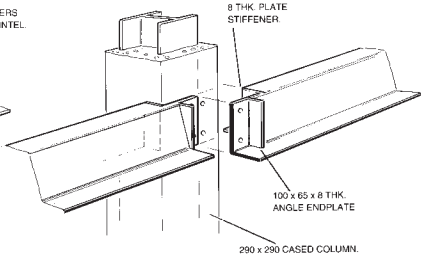


FIG. 2. H. P. BULMER & CO.'s TECHNICAL CENTRE, HEREFORD

SUPERLINTELS WITH ENDPLATES DRILLED FOR BOLTING TO CASED COLUMN & LEAVING UNOBSTRUCTED SOFFIT.



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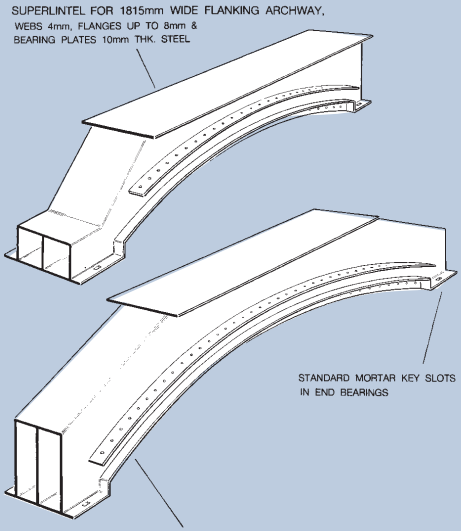
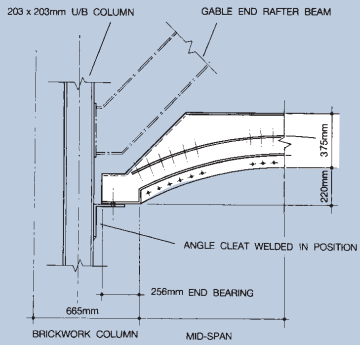
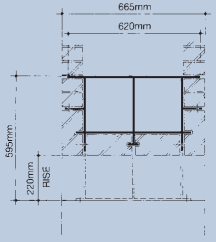
Superlintel specially designed to carry segmental brickwork archways between columns and with end bearings supported by the structural steelwork.



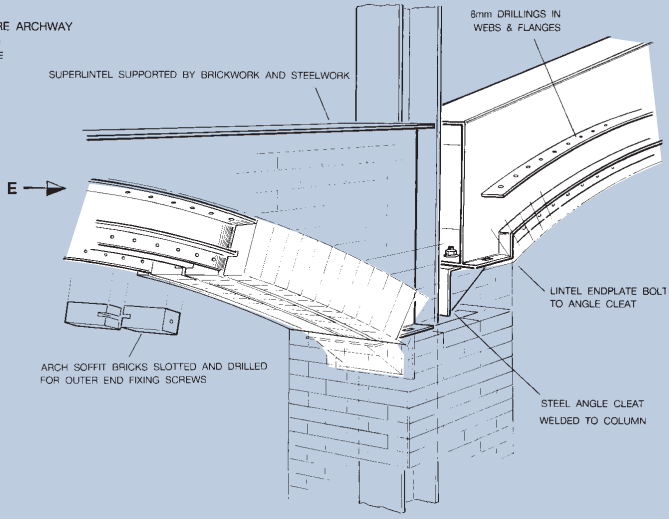


TYPICAL DETAIL AT SPRINGING OF SIDE ARCHES

POSITION 'A' IN ELEVATION



MID-SPAN SECTION IN DIRECTION 'E'



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LARGE SEMI-CIRCULAR ARCHED

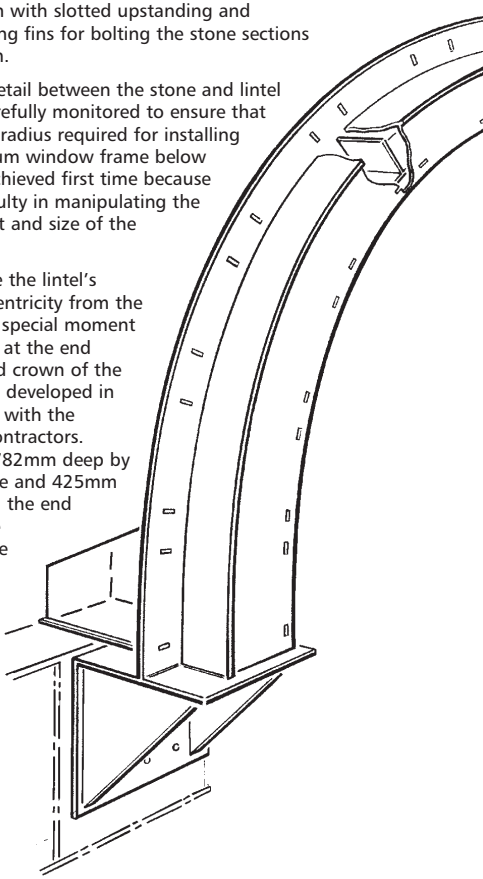
Extremely Large Arch

High above the main entrance at Tesco, Maldon (Essex), is a 5.25m span stonework arch formed from twelve L-shaped reconstituted stone segments each weighing 320kg and measuring 665mm high by 490mm deep.

This stonewrk and 215mm solid brickwork above it are supported by a 'Superlintel', designed as a box plate section with slotted upstanding and downstanding fins for bolting the stone sections into position.

The fixing detail between the stone and lintel was very carefully monitored to ensure that the internal radius required for installing the aluminium window frame below would be achieved first time because of the difficulty in manipulating the great weight and size of the stonework.

To overcome the lintel's 600mm eccentricity from the steel frame, special moment connections at the end bearings and crown of the lintel wwere developed in close liaison with the steelwork contractors. Measuring 782mm deep by 615mm wide and 425mm high overall, the end bearings are bolted to the vertical and top flanges of the 686 x 254 x 125 UB while being profiled around a 203 x 203 x 46 UC.



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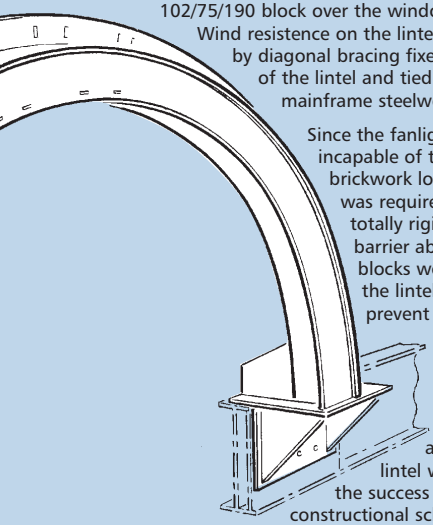
LINTELS FOR MALDON AND SLOUGH

Railway Theme in Arch

The ornate cast iron fanlight used the main entrance at Slough is inspired by the architecture of adjacent listed railway buildings and the work of Isambard Kingdom Brunel.

Connecting between concrete encased UBs, a 8.14m clear span 'Superlintel' carries four feature brick header courses and gable wall construction of 102/75/190 block over the window assembly. Wind resistence on the lintel was stabilised by diagonal bracing fixed to the crown of the lintel and tied back into mainframe steelwork.



Since the fanlight was incapable of taking any brickwork loading, the lintel was required to act as a totally rigid protective barrier above it. Special blocks were supplied on the lintel soffit to prevent stresses transferring into the window head. As with Maldon, the accuracy of the lintel was the key to the success of the constructional scheme for this importnat focal feature at the main entrance.

The illustration is of the large lintel for Maldon. The below illustrates the size of the lintel when loaded in our works.

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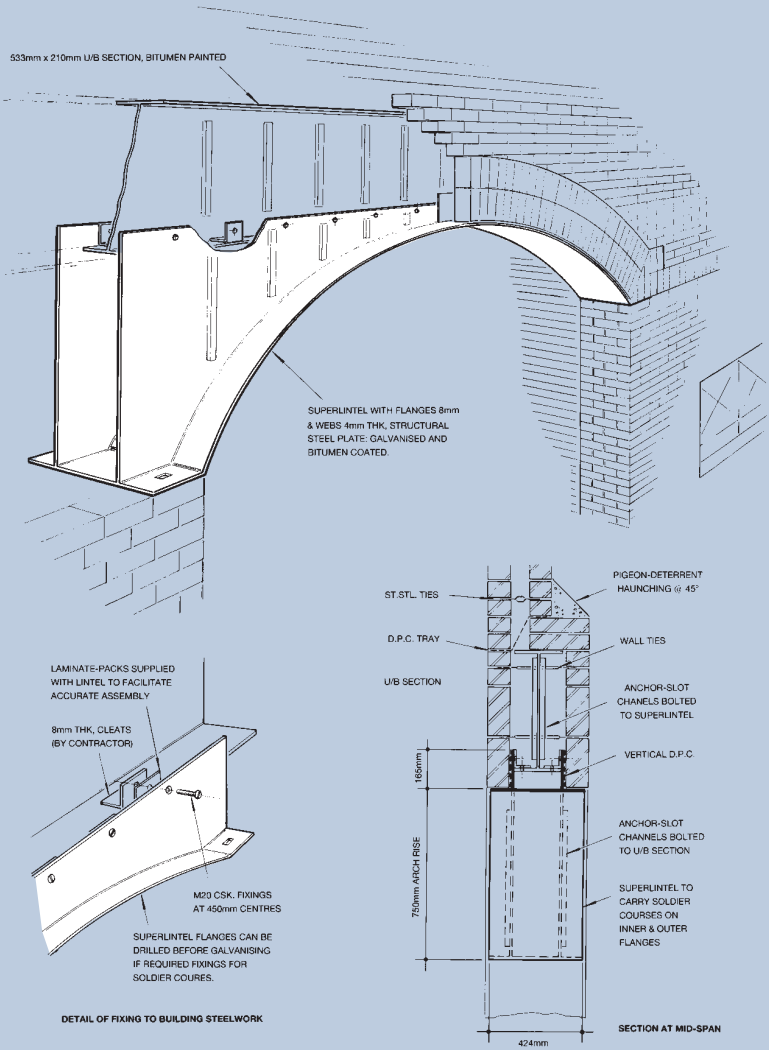
Segmental arched soffit Superlintels of 5635mm clear span over archways giving access to rear of buildings.



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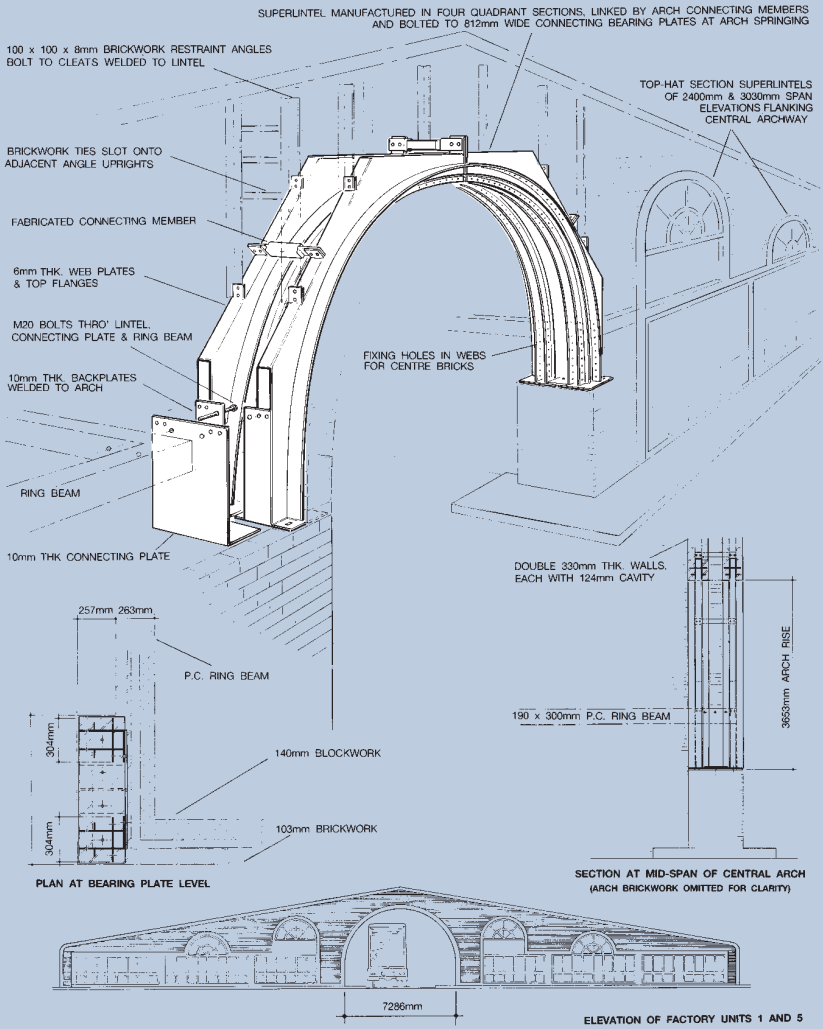
Composite semi-circular arch Superlitel in 4 sections carrying arch of 7286mm span in double cavity walling linking adjacent factory units. Semi-circular top hat section Superlintels featuring in frontage on either side of archway.



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WARNDON DESIGN REFLECTS RURAL SURROUNDINGS

The village of Warndon, a focus of new residential development on the outskirts of Worcester lying close to the M5, represented an ideal 'edge-of-town' site for Tesco.

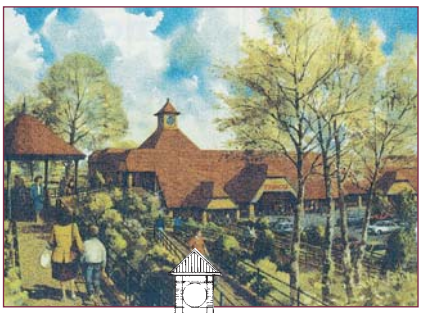
Carefully designed and extensively landscaped to blend with its rural setting, the store offers a new shopping experience away from urban congestion, being safer and more accessible for families and the disabled.

Architects for the project, Saunders Partnership, outline the design:

"Tesco's superstore development at Warndon, Worcester, is the result of the resolution of a difficult retail brief and theincorporation of extremely detailed requirements of the Local Authority.

The design of the elevations of the store is based on a Worcester barn aesthetic, largely taken from the existing agricultural buildings of Lyppard Grange which, after conversion, will form the remainder of the new Local Neighbourhood Centre constructed to serve the surrounding new residential development. Due to the local topography and in order to reduce the impact of the scale of the development on the surrounding housing, the store is cut into the existing landscape by some 5 metres. As a result, there were considerable constraints during construction, with limited access to the eastern and southern elevations to the building. It was essential therefore to incorporate brickwork lintel support as part of the erection of the steel frame so that access was maximised during construction, with limited access to the eastern and southern elevations to the building. It was essential therefore to incorporate brickwork lintel support as part of the erection of the steel frame so that building access was maximised during construction. The brickwork detailing employed, including plinths, piers, corbels and dentil and soldier courses, was a direct requirement of the Planning Department and an extremely important element of the overall design. The use of Superlintels enabled the planners' requirements to be satisfied without compromising the sequencing or ease of construction. In particular, the Superlintel over the main entrance allows a clear 12 metre span forming the A-Frame which supports brickwork and clocktower above.

Owing the 'fast-track- nature of this project and the restrictions of the site, structural and constructional solutions needed to be found which would neither compromise its construction nor its completed appearance. Jones of Oswestry have made a valuable contribution to achieving these aims."



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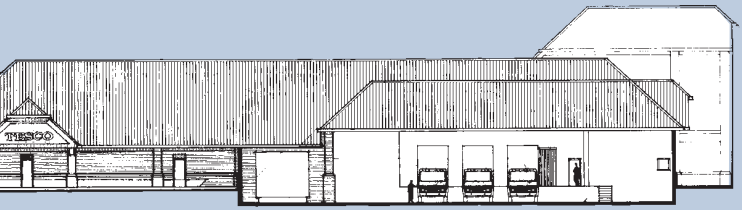

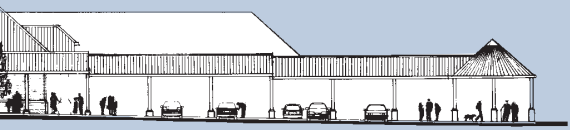

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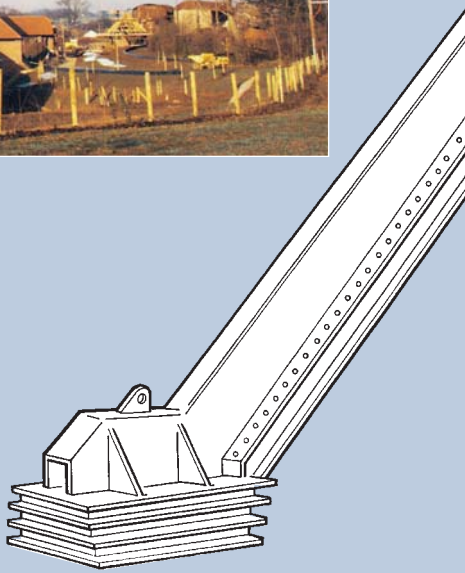

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The Products:

'A' Frame for Main Entrance

A Massive 'SuperLintel' A-frame assembly, measuring 12.214m overall and 4.598m high, sits astride brick encased steel columns to form the imposing gable feature entrance (see Fig.1) While providing large-span support for the triangular brickwork panel, technology gave the architects the option of a fully bricked soffit rather than unclad metal to further embellish an important gateway to the store.

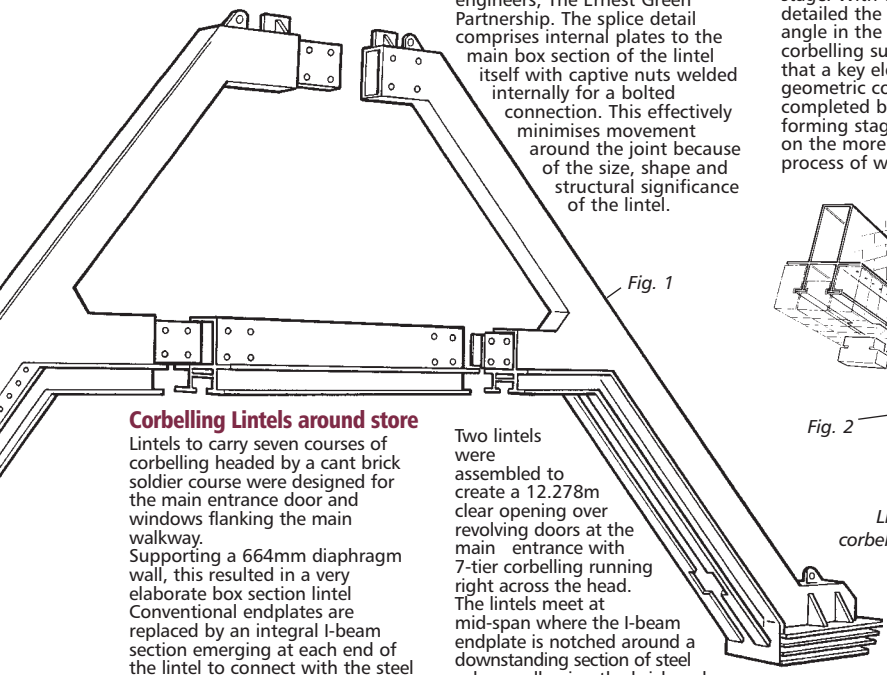

Fig. 1

Corbelling Lintels around store

Lintels to carry seven courses of corbelling headed by a cant brick soldier course were designed for the main entrance door and windows flanking the main walkway.
Supporting a 664mm diaphragm wall, this resulted in a very elaborate box section lintel Conventional endplates are replaced by an integral I-beam section emerging at each end of the lintel to connect with the steel columns using brackets. The structural integrity of the lintel is therefore largely engineered at the endplate where mainframe strength is "channelled" into the body of the lintel, with diaphragm stiffening reinforcing the box section span.

The lintel not only carries a soldier course and full brick fixing carriage, but also supports corbelled brickwork detail. (see Fig. 2)
The assembly continues above the line of the required structural opening almost to an apex. While serving as a building line, this configuration of steel provides essential structural reinforcement and a facility for pinning back the lintel for total stability.
The lintel was fabricated in three manageable units and spliced at convenient sections with HSFG bolts, specified by the structural engineers, The Ernest Green Partnership. The splice detail comprises internal plates to the main box section of the lintel itself with captive nuts welded internally for a bolted connection. This effectively minimises movement around the joint because of the size, shape and structural significance of the lintel.

Two lintels were assembled to create a 12.278m clear opening over revolving doors at the main entrance with 7-tier corbelling running right across the head.
The lintels meet at mid-span where the I-beam endplate is notched around a downstanding section of steel column, allowing the brickwork carriage to pass in front of the steel frame.

All unexposed contact faces of the splice were given an optically smooth finish in our works to allow the special bolted connection to be made.

All-round vision with 'Design 2000'

With the advantage of CAD, Jones' allows us to plot the development of a design drawings through each stage of manufacture right up to installation - and make essential adjustments which benefit economy and efficiency at each stage. With this "vision", we detailed the use of a Z-section angle in the fabrication of the corbelling support. This meant that a key element of the geometric composition could be completed by machine at the steel forming stage, reducing the onus on the more time consuming process of welding.

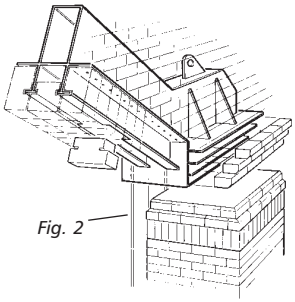

Fig. 2

Lintel end detail showing corbelled feature 'skirt' which conceals bracketed end bearing at rear of B/wk pier.

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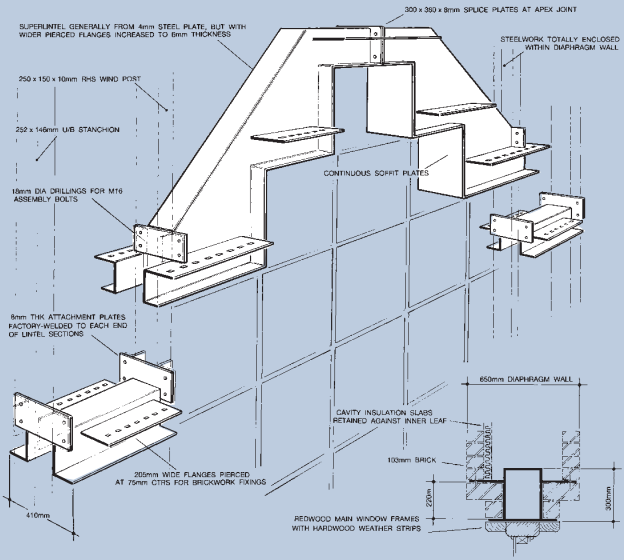
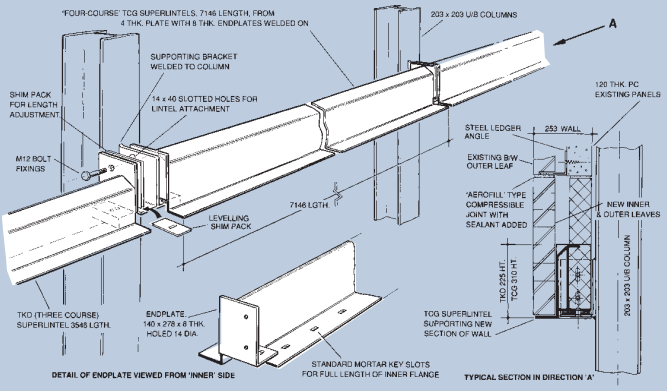
Top Hat Section stepped-arch 'Superlintel' assembly in four sections, spanning 6.3 metres and carrying corbelled courses over 10.5 metres height window.



SF Section Superlintels of 7m and 3m spans, manufactured with integral endplates for bolting to existing steelwork. This arrangement enabled new strip windows to replace existing ground floor wall sections in a system-built structure.



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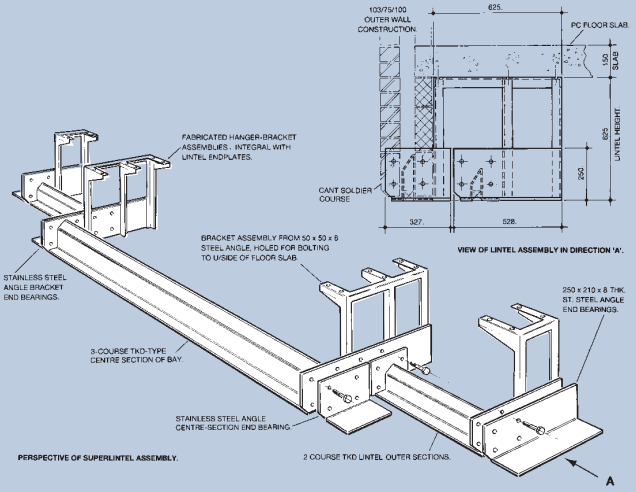
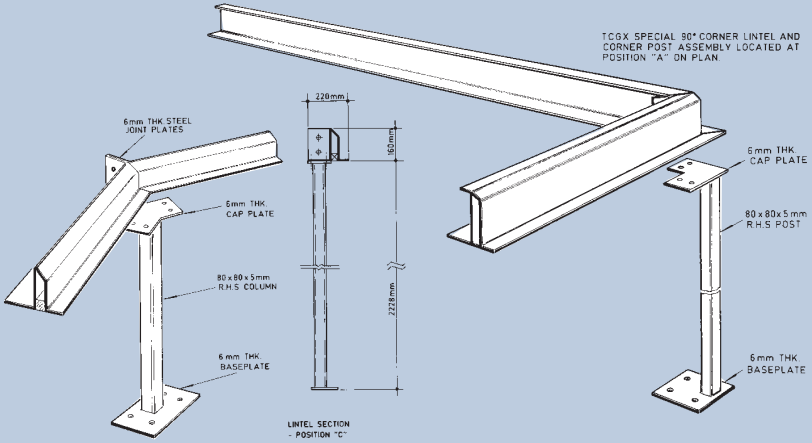
5.4 metre stepped-bay CW type Superlintel assemblies with fabricated integral support framing at endplate positions. The design incorporated both stainless, and bitumen painted, galvanised, steel.

THE ARCHITECT'S REQUIREMENT AT PRESTWOOD HOUSE WAS TO ACHIEVE MAXIMUM GLAZED AREA IN THE 1ST & 2ND FLOOR BAY WINDOW PANS, BY ELIMINATING LOAD BEARING MULLIONS.

THE LINTEL DESIGN SPECIFICATION CALLED FOR STAINLESS STEEL END-BEARING PLATES IN THE FLOOR POSITIONS SHOWN, WITH THE SPANS OF THE LINTEL BAY SECTIONS OF GALVANISED STEEL. OUR STANDARD 75-MICRON BITUMINOUS PAINT FINISH ON THE LINTELS, ENDPLATES AND BRACKETS PRECLUDES ANY POSSIBILITY OF GALVANIC ACTION WITH THE STAINLESS STEEL SECTIONS.



Special 'Superlintel' and post assemblies, supplied disassembled for bolting up on site. Total of 30 lintels supplied, all with front flanges reduced to 50mm for cant brick support.



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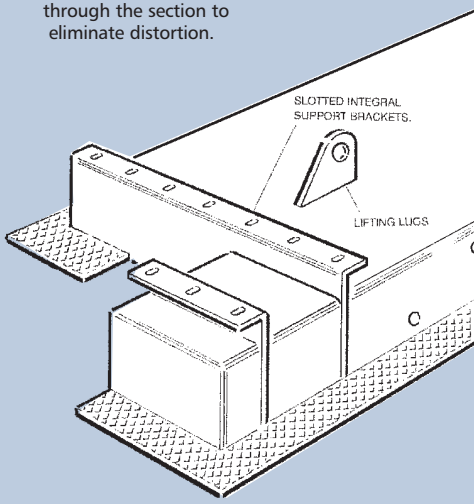
UNUSUAL DESIGN FOR ROYSTON STORE

Tesco's new superstore at Royston stands on a flat open site of nearly 8 acres with spacious parking areas and extensive landscaping to retain the rural nature of the surroundings. The two storey building makes an important visual contribution to the Northern edge of Royston. The exterior has been designed to be compatible with the local architecture, but without pastiche or slavish copying of style, and the stark boxlike appearance of many superstores has been successfully avoided.

Though largely flat-roofed, the pitched outer sections of the mansard type roof constructiveness to the various sections of the building; with red roof tiling matching the red brickwork columns of the ground floor. A 300mm high brick soldier course encircles the building above the stone capped, fluted, columns and gives the effect of traditional beam-and-column construction. Weather protection is well provided for at Royston, with curtain windows extending down to 2.7m height within archways flanking the approach to the main entrance, and a covered walkway reaching 60m into the parking area. Behind the columns, 5 metre wide single-storey walkways also extend along North and east elevations to give covered access for the Superstore's staff as well as for customers.

As the sectional-construction stone feature capitals of the walkway columns are non-load bearing, the initial thought of spanning the 5m stanchion spacing, with even twinned I-beams, was only a partial solution to brickwork above. The continuous flat soffit desirable to create a 'monolithic' beam effect, and support the soldier bricks, would have involved a fabricated structure below the beams. Called in at an early stage, our designers in association with the structural consultants, proposed wide box beam lintels at first floor level, with keying mesh on shortened inner and outer flanges for the pistol grip soldier bricks. The blockwork inner leaf of the outer wall was carried on the flat-top section; and the clear flat soffit plates were etch primed for the site applied paint finish.

The final design included internal diaphragms and longitudinal channels to resist lateral bending and loads across the section, while the mounting brackets and lifting lugs were also carried right through the section to eliminate distortion.



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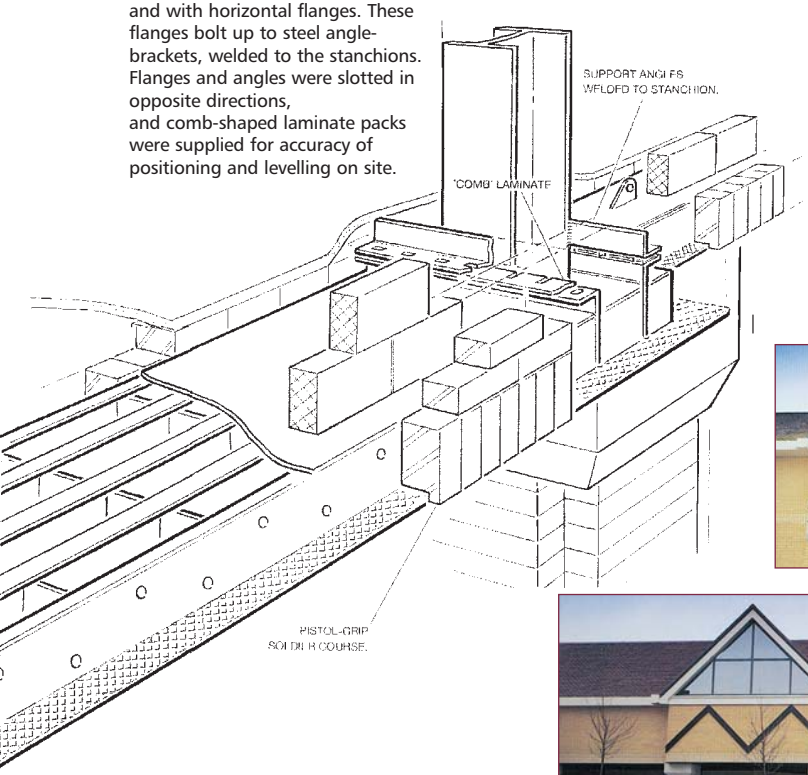
Gable sections of the perimeter walkways step out to 783mm from the stanchion centres, providing a 1030mm wide soffit to achieve the architectural requirement. These lintels also formed an integral part of the structural frame at this level. Attachment of these extra wide lintels in the steelwork was a key feature and achieved with 10mm thick vertical plates, welded-in across the full width of the section and with horizontal flanges. These flanges bolt up to steel angle-brackets, welded to the stanchions. Flanges and angles were slotted in opposite directions, and comb-shaped laminate packs were supplied for accuracy of positioning and levelling on site.

This means of precise height adjustment was important to avoid loading on the brickwork columns. All 37 Superlintels supplied for Royston had through-welded lifting lugs to facilitate transport and site handling. As standard, all had the total protection of 'hot-dip' galvanising after manufacture by our controlled on-site galvanising facility.



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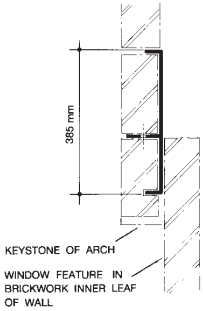

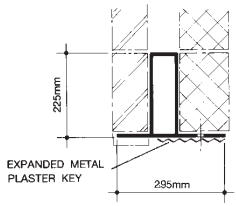

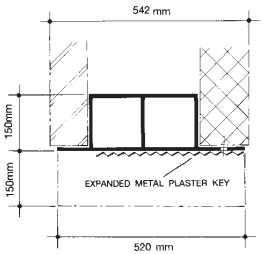

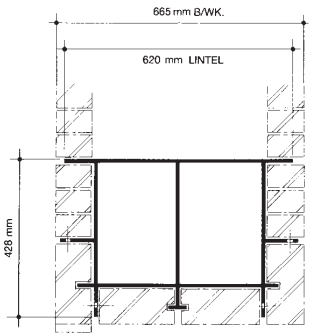

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ARCHED LINTEL DESIGN CARRIED AROUND BANBURY STORE

Banbury, another town with a history dating back to medival times has prompted Tesco Foodstores to develop a supermarket that is sympathetic to its surroundings.

Architects Mason Richards Partnership of Birmingham were appointed to provide a design that was aesthetically pleasing using traditional building materials and a series of brick arches running around the entire store.

Many special long life 'Superlintels 2000' were produced for this project and the four sections undertaken reproduced here indicate the various methods of brick/block construction. The larger section shown indicates how, using slotted brickwork, an arched soffit entirely faced in brick, can be achieved. Close liaison between our drawing office and the architects enabled these individual designs to be produced.

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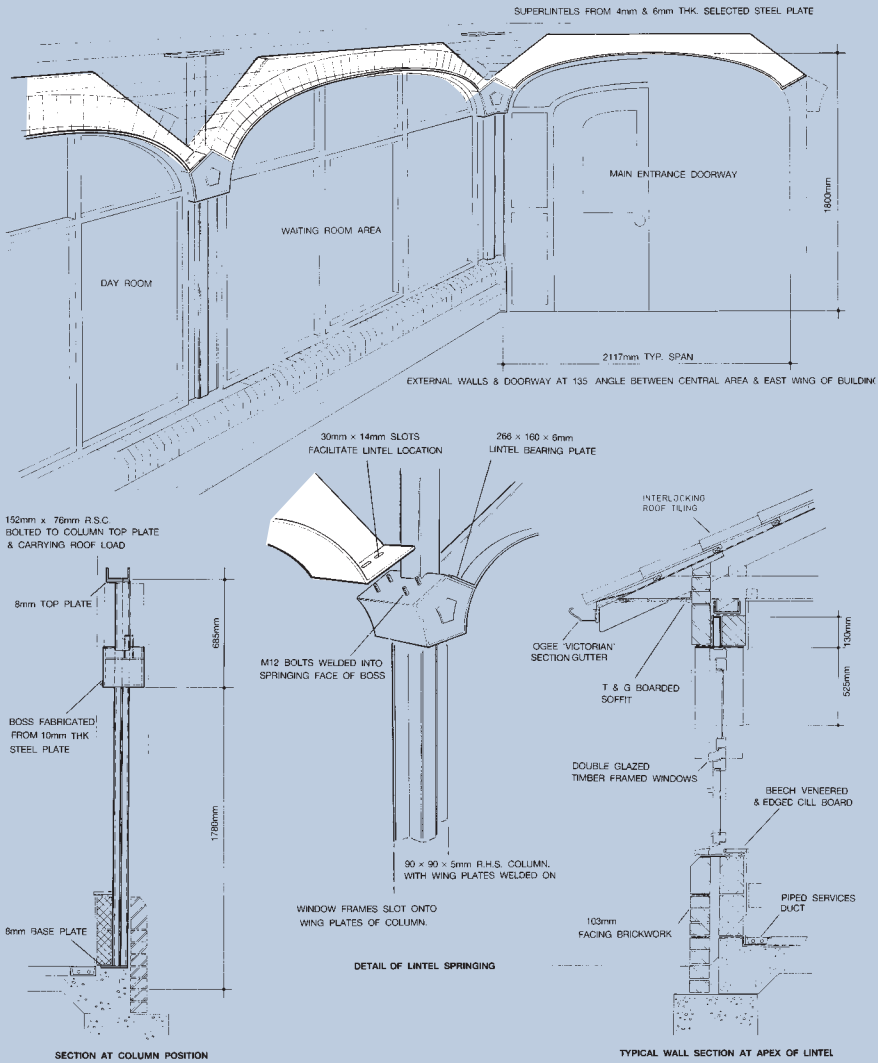
JONES OF OSWESTRY

Adjacent elliptical-arched top hat section Superlintels springing from ornamental fabricated column assemblies.



DETAIL OF LINTEL SPRINGING

SECTION AT COLUMN POSITION

TYPICAL WALL SECTION AT APEX OF LINTEL

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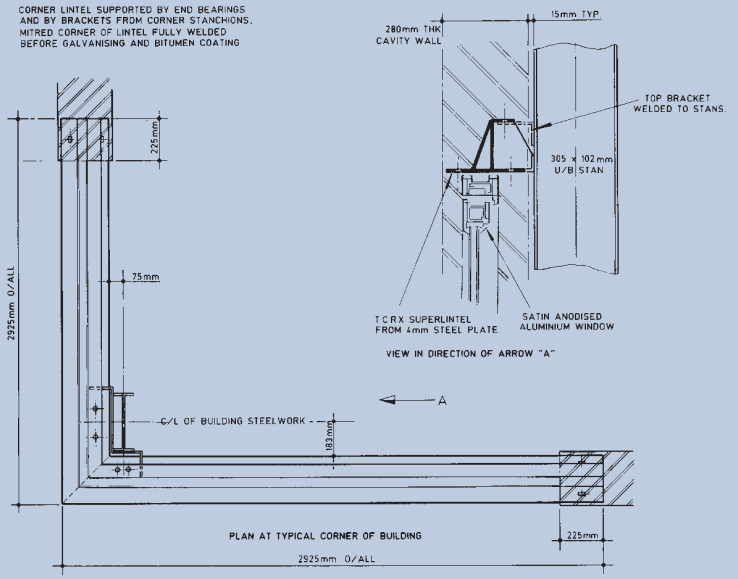
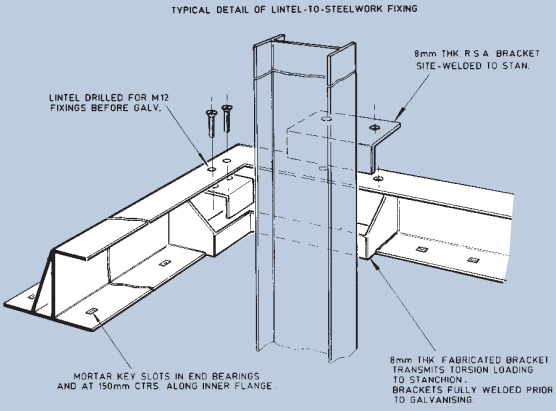
90° corner lintel assemblies for ground and first floor window positions. Supplied with full bracketry for fixing to corner stanchions of steelwork.





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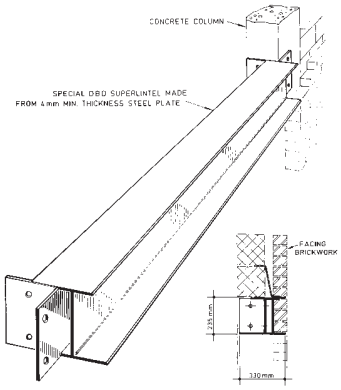
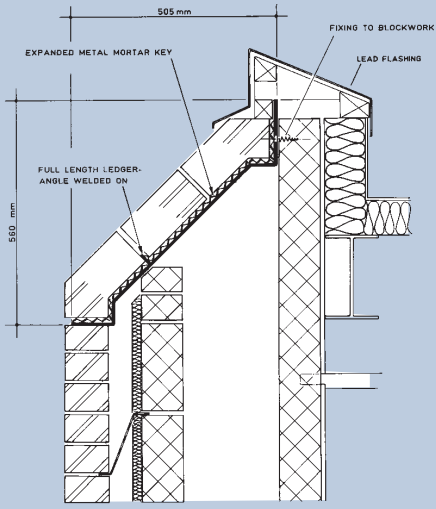
UNIQUE COPING CAVITY TRAYS FOR BUSINESS PARK

Description: Special Superlintel with integral end plates, drilled for column attachement.



SECTION THROUGH LINTEL



TYPICAL WALL SECTION

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04/05

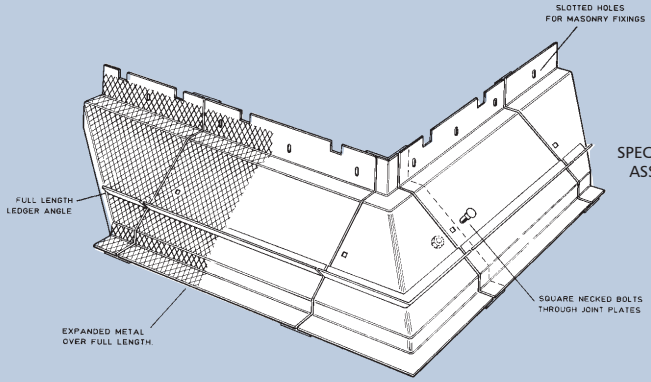
The Architecturally unusual copings on this Chineham Business Park development in Basingstoke needed more than one unique feature before construction. Through research and development, and combined efforts of the Architects and our design team, the correct solution was obtained with our galvanised steel cavity trays.

Because of the exposed position of the copings at the head of brick columns each side of large window apertures, there was an obvious fear of brick displacement. As can be seen in the technical drawings a unique cavity tray was developed, the whole outside surface of which was covered in Expamet 2097 for brick keying. Also for added security a wedge support for the centre brick was welded around the whole tray, to provide the added support needed.

The unique shape of the coping cavity trays, created a problem for our steel fabricators, with the corner trays (as illustrated) being the most difficult. However the production problems were overcome, and each cavity tray was then hot dip galvanised to well above the recognised British standard for maximum protection against corrosion.

Each cavity tray was also built in sections which bolted together on site making installation far easier for the contractor.

All brickwork being keyed into the cavity trays was laid with water-proof epoxy resin mortar and the top edge of the whole coping sealed with lead flashing, providing a totally weatherproof finish.



SPECIAL COPING SUPPORT TRAY ASSEMBLY IN FIVE SECTIONS

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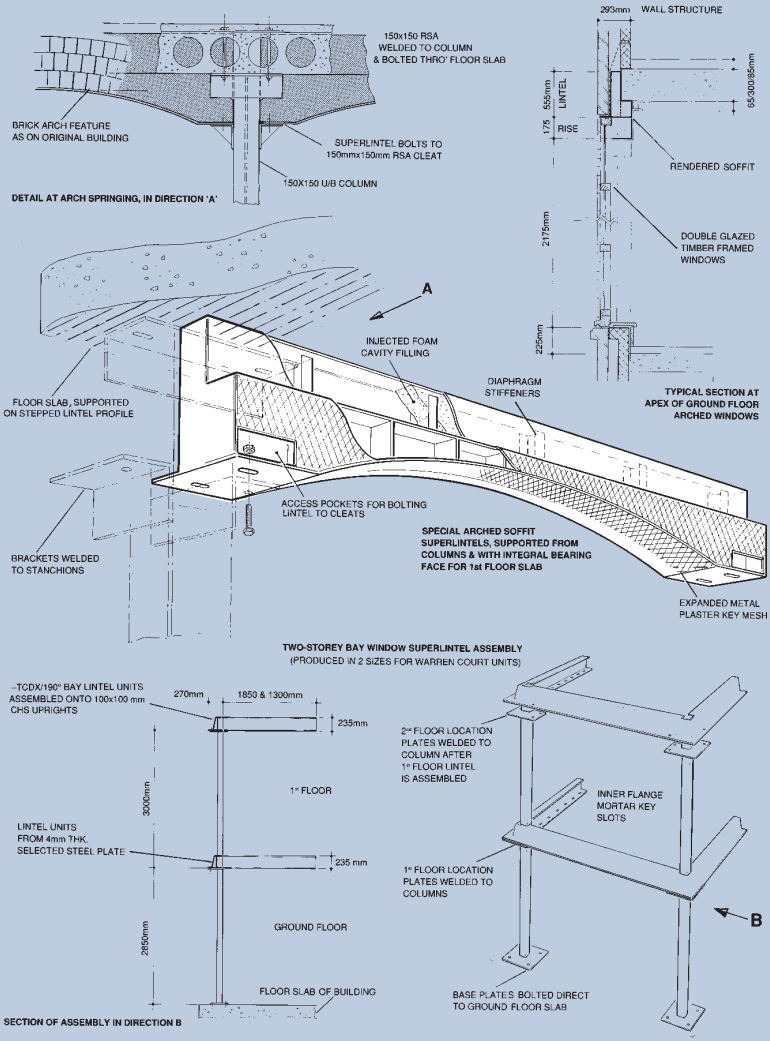
Specially designed insulated arched soffit Superlintels and Two-storey bay window 'Superlintel' assemblies for individual requirements on new and refurbished buildings of major office development.



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